CLAIM AMENDMENTS

1 - 3. (canceled)

4. (currently amended) The system unit according to claim 15 wherein the expansion vessels further include a middle expansion vessel, the upstream expansion vessel for the gas mixture obtained by desorption comprising hydrogen and carbon monoxide [[, has]] having a line going to the heat exchanger and a line going to the middle expansion vessel for the methanol containing liquid.

5. (currently amended) The system unit according to claim ~~15, further comprising a~~ 4 wherein the middle expansion vessel for the carbon dioxide gas obtained by desorption has a line going to the heat exchanger and a line going to the downstream expansion vessel for the methanol containing liquid.

6. (currently amended) The system unit according to claim 15 wherein the downstream expansion vessel for the gaseous carbon dioxide obtained by desorption has a line going to the heat exchanger and a line for the methanol containing liquid to the absorber connected by a line feeding the methanol heated up there to the liquid/gas separator.

7. (previously presented) The system unit according to claim 15 wherein the liquid/gas separator has a branch line feeding gaseous carbon dioxide and another line feeding separated methanol to the downstream regenerator.

8. (previously presented) A process for desorption of carbon dioxide and other gaseous impurities from methanol in the system in accordance with claim 15, wherein the desorption is carried out stepwise in the expansion vessels, the heat exchanger and the liquid/gas separator, the process comprising the steps of:

feeding the methanol leaving the expansion vessel C at a temperature of -60°C ± 10°C and a pressure of 1 to 2 bar into the heat exchanger E,

heating the methanol in the heat exchanger to a temperature of -10 ± 5 °C and thereafter feeding the heated methanol into the liquid/gas separator D, and

flowing substances between the expansion vessels and to the heat exchanger and liquid/gas separator primarily by a thermosiphon effect.

9. (canceled)

10. (previously presented) The process according to claim 8 wherein in the upstream expansion vessel the pressure decreases from about 55 bar to about 9 bar and mainly hydrogen and

carbon monoxide are desorbed at a temperature of about -45°C, the method further comprising the steps of

recovering a gas fraction obtained after passing through the heat exchanger to the process, and

feeding the liquid fraction to a middle expansion vessel between the upstream and downstream vessels.

11. (previously presented) The process according to claim 8 wherein in a middle expansion vessel between the upstream and downstream vessels the pressure decreases from about 9 bar to about 2.7 bar and a liquid fraction is obtained along with gaseous carbon dioxide at a temperature of about -45°C, to about -52°C, the process further comprising the step of

feeding the gaseous carbon dioxide through the heat exchanger E and thence out of the system feeding the liquid fraction to the downstream expansion vessel.

12. (previously presented) The process according to claim 8 wherein, in the downstream expansion vessel pressure decreases from about 2.7 bar to about 1.2 bar and gaseous carbon dioxide is obtained at a temperature of about -52°C, to about -60°C, the process further comprising the step of

feeding the gaseous carbon dioxide through the heat exchanger and thence out of the system.

13. (previously presented) The process according to claim 8, further comprising the steps of

dividing a liquid fraction in the downstream expansion vessel C into two streams,

feeding one of the streams to the absorber and

passing the other stream through the heat exchanger via the output line and feeding it to the liquid/gas absorber.

14. (previously presented) The process according to claim 8, further comprising the steps of:

recovering a liquid fraction in the liquid/gas separator,

feeding the recovered liquid fraction to the regenerator for removal of the last traces of carbon dioxide, and

purifying a gas fraction with further carbon dioxide rich gas fractions is obtained to the process.

15. (currently amended) A system comprising:

an absorber in which high-pressure methanol is contacted with synthesis gas to transfer impurities including carbon dioxide from the gas to the methanol;

a heat exchanger having a top side and a bottom side;

a plurality of series-connected expansion vessels including an upstream expansion vessel and a downstream expansion vessel;

means for feeding impurity-laden methanol from the absorber through the heat exchanger. through the upstream expansion vessel, and into the downstream expansion vessel for forming in the downstream expansion vessel a body of methanol having a liquid level;

a liquid/gas separator;

an inlet line feeding methanol from the downstream expansion vessel through the bottom side into the heat exchanger, the inlet line having a portion about 0.5 m below the bottom side ~~, whereby carbon dioxide is desorbed from the methanol in the separator~~;

an output line extending from the top side of the heat exchanger to the liquid/gas separator to form therein a body of methanol having a liquid level, whereby carbon dioxide is desorbed from the methanol in the separator, the liquid/gas separator and downstream expansion vessel being relatively oriented such that the liquid level in the downstream expansion vessel is between 1 m and 20 m above the liquid level in the liquid/gas separator, the liquid/gas separator and the heat exchanger being relatively oriented such that the liquid level in the liquid/gas separator is about 0.5 m above the top side of the heat exchanger; and

a regenerator receiving methanol from the liquid-gas separator.